REMARKS

Claims 1-34 remain pending in this application for which applicants seek reconsideration.

Amendment

The specification and claims 1, 3, 8, 15, and 24 have been amended to change the passage "each of said first and second films" to --the reflector-- and --said reflector--, respectively, in light of the 35 U.S.C. § 112 rejection. Support for this change is found in the original specification, in particular the Tables, which make it clear that the measured reflectance is from the reflector and the individual layers. Moreover, claim 1 has been amended to define that the difference between the maximum and minium values of light reflectance of wavelength components in the visible light region is approximately 10% or less. See the paragraph spanning pages 9-10, the last paragraph of page 13, and Tables 1-6 for support. No new matter has been introduced.

Art Rejection

Applicants will exclusively address the rejection of claim 1, the only independent claim in this application, because if claim 1 overcomes the rejections, the rejection of the depending claims will be rendered moot.

The examiner rejected claim 1 under 35 U.S.C. § 102(b) or (e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious, or under § 103(a) as unpatentable over Hilton (USP 4,185,894), Usami (USP 5,532,851), Kamiya (USP 6,317,179), Prince (USP 5,510215), and Ebihara (USP 5,990,995) in view of the above references. Applicants submit that claim 1 distinguishes over the applied references as they do not teach a substrate for LCD elements that has the claimed reflector features, namely having each of the first and second films to have a thickness that allows the light reflectance in a visible light region of the reflector to fall within a range of 5-95% and the difference between the maximum and minium values of light reflectance of wavelength components (i.e., RGB) in the visible light region to be approximately 10% or less.

First, as to shifting the burden to applicants on the basis of inherency, for the burden to

shift to applicants, the structure of the prior art relied upon must be substantially identical, as explained in MPEP 2112. Applicants submit that none of the applied references disclose a substantially identical structure. Accordingly, applicants submit that the burden of establishing inherency still lies with the examiner. Specifically, the claimed invention is a substrate for LCD elements having a transparent substrate and a reflector composed of a predetermined number of pairs of a first film having a high refractive index and a second film having a low refractive index. Each of the first and second films is composed of a dielectric material, and is stacked on the transparent substrate. Moreover, each of these films has a particular refractive index of light of not less than 1.8 at a wavelength of 550 nm for the high refractive index and not more than 1.5 at the wavelength of 550 nm for the low refractive index. Moreover, claim 1 further calls for each of the first and second films to have a thickness that allows the light reflectance in a visible light region of the reflector to fall within a range of 5 - 95% and the difference between a maximum value and a minium value of light reflectance of wavelength components in the visible light region to be approximately 10% or less. The applied references do not disclose the thicknesses (which is a structural) of the claimed first and second films having the claimed refractive indices, at which the reflector would produce the claimed 5-95% visible light reflectance and the difference of visible light region wavelength components being approximately 10% or less.

In relying on inherency, it appears that the examiner is suggesting is that the prior art can be configured to meet the claimed limitation. If so, that is nothing more than an obvious to try argument. For the inherency rejection to be proper, the prior art must necessarily contain the claimed features, characteristics, properties, etc., not that they could have.

Specifically, Hilton discloses using a multilayer arrangement of silicon and silicon dioxide layers as films of dielectric materials for an LCD. Hilton further discloses that the reflected color of the LCD element can be determined based on the thickness of and the combination of the silicon and silicon dioxide layers. See column 3, lines 45, *et seq.*, and Chart A. But Hilton does not disclose or teach the thickness, or manipulating the thickness, of each of its silicon and silicon dioxide films to obtain a broad range of light reflectance of the reflector and to keep the difference between the minimum and maximum values of light reflectance of

wavelength components in the visible light region to approximately 10% or less.

Claim 1 also distinguishes over Usami for the same reason, and because Usami teaches an optical switching element rather than a substrate for LCD elements. Usami discloses interference layers 109, 111 having high and low refractive indices arranged alternately to obtain an ideal light transmittance characteristic. It discloses nothing about the light reflectance. Indeed, because Usami is in a completely different technical field, Usami would not be concerned with the reflectance. Applicants submit that Usami would not have disclosed or taught the claimed invention, where each of the films has a particular thickness to maintain a broad range of light reflectance of the reflector and to keep the difference between the minimum and maximum values of light reflectance of wavelength components in the visible light region to approximately 10% or less.

Kamiya also discloses an LCD having dedicated interference film stacks 10, 20, 30 for each of the visible light components (RGB). The thickness of the film stack is set based on the color associated with it. This is completely different from what claim 1 calls for, namely each of the films having a particular thickness to obtain a broad range of light reflectance of the reflector and to keep the difference between the minimum and maximum values of light reflectance of wavelength components in the visible light region to approximately 10% or less. Indeed, because Kamiya uses dedicated film stacks for each color component (RGB), it specifically teaches away from the claimed invention, where each of the films has a thickness to keep the difference between the minimum and maximum values of light reflectance of wavelength components (RGB) across the visible light spectrum to approximately 10% or less.

Prince discloses a multilayer dielectric color filter formed of multiple alternate layers 310 of high refractive index inorganic material 320 and low refractive index inorganic material 330. In Prince, the thicknesses of the individual layers are determined by the required spectral characteristics of its filter. Prince does not disclose any specific thickness of each of the layers 320, 330. Further, Prince neither discloses or suggests the thicknesses of each of the films to obtain a broad range of light reflectance of the reflector and to keep the difference between the minimum and maximum values of light reflectance of wavelength components in the visible light region to approximately 10% or less.

Ebihara discloses a reflection type LCD for converting incident light into electric power. The LCD has an LCD layer 3, a reflection layer 4, and a light absorbing layer 5. As correctly recognized by the examiner, Ebihara lacks the claimed reflector structure. Accordingly, the examiner relies upon Hilton, Usami, Kamiya, and Prince for the proposition that the claimed reflector structure would have been obvious. As applicants have explained above none of these references would have taught the claimed reflector structure that can keep the difference between the minimum and maximum values of light reflectance of wavelength components in the visible light region to approximately 10% or less. Moreover, applicants submit that there would not have been any motivation to substitute Ebihara's reflector 4 for a different one since Ebihara nor any of the applied references suggests that the modification offered by the examiner would improve Ebihara's device. Simply put, why would an ordinary artisan be motivated to replace Ebihara's reflector? Moreover, applicants believe that the combination would not have been tenable because Ebihara's invention can be compromised by such a combination, defeating the purpose of its invention.

Conclusion

Applicants submit that claim 1 structurally distinguishes over the applied references because none of them disclose, suggest, or teach that each of layers of the reflector can be made to keep the difference between the minimum and maximum values of light reflectance of wavelength components across the visible light region to approximately 10% or less. Applicants thus urge the examiner to issue an early Notice of Allowance. Should the examiner have any issues concerning this reply or any other outstanding issues remaining in this application, applicants urge the examiner to contact the undersigned.

ATTACHMENT

MARKED UP VERSION

IN THE SPECIFICATION:

The specification has been amended as follows:

Page 3, the first full paragraph has been amended as follows:

--To attain the above object, the present invention provides a substrate for liquid crystal display elements comprising a transparent substrate[,] and a reflector composed of a predetermined number of pairs of a first transparent film having a high refractive index and a second transparent film having a low refractive index, each composed of a dielectric material and stacked on the transparent substrate, wherein: the first transparent film has a refractive index of light of not less than 1.8 at a wavelength of 550nm, and the second transparent film is stacked on the first transparent film and has a refractive index of light of not more than 1.5 at the wavelength of 550nm; the predetermined number is an integer not less than 1; and the first transparent film and the second transparent film each have a film thickness thereof set to such a value that the light reflectance in a visible light region of [each of the first and second transparent films] the reflector is within a range of 5-95%.--

Page 4, the paragraph appearing in lines 9-25 has been amended as follows:

--It is preferable that the light reflectance in the visible light region of [each of the first and second transparent films] the reflector is in a range of not less than 5% but less than 25%, wherein: when the predetermined number is 1, the first transparent film has a film thickness of 20-130nm, and the second transparent film has a film thickness of 50-110nm; when the predetermined number is 2, the first transparent film has a film thickness of 5-60nm, and the second transparent film has a film thickness of 5-150nm; when the predetermined number is 3, the first transparent film has a film thickness of 3-80nm, and the second transparent film has a film thickness of 5-160nm; and when the predetermined number is 4, the first transparent film has a film thickness of 5-80nm, and the second transparent film has a film thickness of 5-80nm.--

Pages 4-5, the paragraph spanning these pages has been amended as follows:

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--It is also preferable that the light reflectance in the visible light region of [each of the first and second transparent films] <u>the reflector</u> is in a range of not less than 25% but less than 45%, wherein: when the predetermined number is 1, the first transparent film has a film thickness of 80-110nm, and the second transparent film has a film thickness of 40-60nm; when the predetermined number is 2, the first transparent film has a film thickness of 20-180nm, and the second transparent film has a film thickness of 30-100nm; when the predetermined number is 3, the first transparent film has a film thickness of 10 -130nm, and the second transparent film has a film thickness of 10-170nm; when the predetermined number is 4, the first transparent film has a film thickness of 20-110nm, and the second transparent film has a film thickness of 5-100nm; when the predetermined number is 5, the first transparent film has a film thickness of 10-110nm, and the second transparent film has a film thickness of 5-110nm; and when the predetermined number is 6, the first transparent film has a film thickness of 10-80nm, and the second transparent film has a film thickness of 30-100nm.--

Pages 5-6, the paragraph spanning these pages has been amended as follows:

--Further, it is preferable that the light reflectance in the visible light region of [each of the first and second transparent films] <u>the reflector</u> is in a range of not less than 45% but less than 65%, wherein: when the predetermined number is 2, the first transparent film has a film thickness of 60 - 180nm, and the second transparent film has a film thickness of 40-90nm; when the predetermined number is 3, the first transparent film has a film thickness of 20-160nm, and the second transparent film has a film thickness of 10-150nm; when the predetermined number is 4, the first transparent film has a film thickness of 20-180nm, and the second transparent film has a film thickness of 10-110nm; when the predetermined number is 5, the first transparent film has a film thickness of 30-190nm, and the second transparent film has a film thickness of 10-140nm; when the predetermined number is 6, the first transparent film has a film thickness of 10-150nm, and the second transparent film has a film thickness of 10-100nm; when the predetermined number is 7, the first transparent film has a film thickness of 20-150nm, and the second transparent film has a film thickness of 5-110nm; when the predetermined number is 8, the first transparent film has a film thickness of 20-130nm, and the second transparent film has a film

thickness of 5-110nm; and when the predetermined number is 9, the first transparent film has a film thickness of 20-120nm, and the second transparent film has a film thickness of 10-90nm.--

Page 6, the first full paragraph has been amended as follows:

--It is also preferable that the light reflectance in the visible light region of [each of the first and second transparent films] the reflector is in a range of not less than 65% but less than 95%, wherein: when the predetermined number is 3, the first transparent film has a film thickness of 80-160nm, and the second transparent film has a film thickness of 40-110nm; when the predetermined number is 4, the first transparent film has a film thickness of 60-140nm, and the second transparent film has a film thickness of 40-100nm; when the predetermined number is 5, the first transparent film has a film thickness of 30-130nm, and the second transparent film has a film thickness of 20-170nm; when the predetermined number is 6, the first transparent film has a film thickness of 20-180nm, and the second transparent film has a film thickness of 10-140nm; when the predetermined number is 7, the first transparent film has a film thickness of 10-150nm, and the second transparent film has a film thickness of 30-130nm; when the predetermined number is 8, the first transparent film has a film thickness of 5-200nm, and the second transparent film has a film thickness of 5-150nm; and when the predetermined number is 9, the first transparent film has a film thickness of 5-200nm, and the second transparent film has a film thickness of 5-140nm.--

The Abstract has been amended as follows:

--A substrate for liquid crystal display (LDC) elements [is provided, which] can meet a variety of required optical characteristics and, at the same time, improve the utilization factor of light without the possibility of inducing a signal delay. The substrate has a transparent substrate and a reflector composed of a [A] predetermined number of pairs of a transparent film having a high refractive index and a transparent film having a low refractive index, each film composed of a dielectric material, are stacked on [a] the transparent substrate. The high refractive index transparent film and the low refractive index transparent film have refractive indices of light of not less than 1.8 and not more than 1.5 at a wavelength of 550nm, respectively. The

predetermined number of pairs is 1 or more, and the high refractive index transparent film and the low refractive index transparent film each have a film thickness thereof set to such a value that the light reflectance in a visible light region of [each of the transparent films] <u>the reflector</u> is within a range of 5 - 95%.--

IN THE CLAIMS:

Claims 1, 3, 8, 15, and 24 have been amended as follows:

--1. (Twice Amended) A substrate for liquid crystal display elements, comprising:

a transparent substrate; and

a reflector comprising a predetermined number of pairs of a first film having a high refractive index and a second film having a low refractive index, each of said first and second films being composed of a dielectric material, and stacked on said transparent substrate,

wherein<u>:</u>

said first film has a refractive index of light of not less than 1.8 at a wavelength of 550 nm, and said second film is stacked on said first film, said second film having a refractive index of light of not more than 1.5 at the wavelength of 550 nm;

[wherein] said predetermined number is an integer not less than 1 and [a film thickness of] each of said first and second films <u>has a thickness that allows</u> [is set to a value in which] the light reflectance in a visible light region of [each of said first and second films falls] <u>said reflector to fall</u> within a range of 5 - 95% <u>and the difference between a maximum value and a minium value of light reflectance of wavelength components in the visible light region to be approximately 10% or less</u>.--

--3. (Three Times Amended) A substrate for liquid crystal display elements as claimed in claim 1, wherein said light reflectance in the visible light region of [each of said first and second films] <u>said reflector</u> is in a range of not less than 5% but less than 25%.--

--8. (Three Times Amended) A substrate for liquid crystal display elements as claimed in claim 1, wherein said light reflectance in the visible light region of [each of said first and second

films] said reflector is in a range of not less than 25% but less than 45%.--

--15. (Three Times Amended) A substrate for liquid crystal display elements as claimed in claim 1, wherein said light reflectance in the visible light region of [each of said first and second films] said reflector is in a range of not less than 45% but less than 65%.--

--24. (Three Times Amended) A substrate for liquid crystal display elements as claimed in claim 1, wherein said light reflectance in the visible light region of [each of said first and second films] said reflector is in a range of not less than 65% but less than 95%.--